REMARKS

Claims 1-45 are pending in the application. Claims 1-15 and 17-45 are rejected. Claim 16 is objected to.

In the Office Action, the Examiner objected to a line after claim 44. The line has been deleted without showing the change above. Showing the change as a strikeout results in a double line which appears more confusing. According, the line has been removed without the strikeout. If this is an improper format for this change, please contact the undersigned.

Claims 1-3, 9, 20, 29, and 44 were rejected under 35 U.S.C. § 102(b) as being anticipated by Roth (U.S. Patent No. 5,315,512). Claims 2 and 33-35 were rejected under 35 U.S.C. §103(a) as being unpatentable over Roth further in view of Mo et al. (U.S. Patent No. 6,012,458). Claim 4 was rejected under 35 U.S.C. §103(a) as being unpatentable over Roth and further in view of Hoff et al. (U.S. Patent No. 6,315,730). Claims 5-8, 10-11, 21-28, 30, 36, 38-43 and 45 were rejected under 35 U.S.C. §103(a) as being unpatentable over Roth and further in view of Ramamurthy et al. (U.S. Patent No. 5,846,202). Claim 12 was rejected under 35 U.S.C. §103(a) as being unpatentable over Roth in view of Ramamurthy, and further in view of Hoff. Claims 13 and 32 were rejected under 35 U.S.C. §103(a) as being unpatentable over Roth in view of Ramamurthy et al., and further in view Holupka (U.S. Patent No. 5,810,007). Claims 14-15 and 17-19 were rejected under 35 U.S.C. §103(a) as being unpatentable over Roth in view of Greer et al. (U.S. Patent No. 5,959,622). Claim 31 was rejected under 35 U.S.C. §103(a) as being unpatentable over Roth in view of Ramamurthy et al., and further in view of Hossack et al. (U.S. Patent No. 6,042,545). Claim 37 was rejected under 35 U.S.C. §103(a) as being unpatentable over Roth in view of Ramamurthy et al., and further in view of Hoff et al.

Claim 16 was objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 1-5, 11, and 29 have been amended. New claim 46 has been added.

Applicants respectfully request reconsideration of the rejections of claims 1-46, including independent claims 1, 21 and 29.

Independent claim 1 claims a processor operative to recognize one or more non-cyclical distinguished events and to select a portion of an ultrasound examination based on the recognition of the one or more distinguished events. As noted at paragraph 28 in the application, R-wave peaks do not qualify as non-cyclical distinguished events because they are part of a regularly repeating cycle.

Roth generates a data set for three-dimensional imaging (col. 2, lines 21-28). Data is selected from an original full examination (col. 2, lines 60-64 and col. 6, lines 33-43). ECG and respiratory readings are used to gate or select specific frames of data from the full examination (col. 4, lines 52-60). The ECG data is examined to identify cycles with a desired length at an appropriate portion of the breathing cycle (col. 7, lines 23-30). The ECG data is then used to select data at an appropriate phase of the heart cycle (col. 7, lines 31-37). See col. 10, line 49 to col. 11, line 6. Since both ECG and breathing data represents repeating cycles, Roth uses repeating cycle information to select images for 3D reconstruction. Applicants respectfully submit that Roth does not recognize non-cyclical distinguished events.

Claim 29 also claims a non-cyclical distinguished event. As discussed above, Roth uses cycle information to select data, not a non-cyclical event.

Independent claim 21 claims marking or storing non-repeating subsets of an examination where the one or more non-repeating subsets are bracketed by one or more pairs of distinguished events. As discussed above, Roth uses cycle or repeating information to select data. Similarly and even as noted by the Examiner, Ramamurthy et al. use repeating triggers (see Figs. 2B, 3B and 4B-D). Roth and Ramamurthy et al. use repeating gating or triggers.

Applicants respectfully submit that a person of ordinary skill in the art would not have used the teachings of Ramamurthy et al. with Roth. Roth collects a fully sampled set of data for later decimation or gating to identify the desired fames (col. 9, lines 5-16). Conversely, Ramamurthy et al. trigger acquisition so that data is only acquired at certain times (col. 6, lines 1-7; col. 6, lines 42-56) or vary a parameter at different time (col. 8, lines 47-62). Thus a person of ordinary skill in the art would not have used the acquisition based triggering and associated teaching of Ramamurthy et al. with the systems and method of Roth adopted to select from or gate a fully sampled previously acquired examination.

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Dependent claims 2-20, 22-28, and 30-46 depend directly or indirectly from independent claims 1, 21, and 29 discussed above, and are thus allowable for at least the same reasons. Further limitations distinguish over the reference or references used to reject the dependent claims.

For example, claims 2 and 3 have been amended to correct antecedent basis. The Examiner premises the rejection on a lack of antecedent basis.

Claims 2 and 33-35 claim a distinguished event based on an absence of motion. Mo et al. discard interpolated frames (col. 5, lines 35-55). Motion is not used to distinguish an event. Additionally, Mo et al. also do not disclose reviewing motion in an image to identify an event as claimed in claim 35.

Claims 4, 12, and 37 claim determining a distinguished event based on a rate of change of brightness. Hoff et al. was cited for this disclosure. Hoff et al. disclose deriving wash-in curves from second harmonic intensities (col. 7 lines 20-24). A plot showing a rapid rise in backscatter may be generated (col. 8, lines 14-18). Hoff et al. merely plot a curve, but do not suggest determining an event based on a rate change. Also, a person of ordinary skill in the art would not have used the trigger based acquisition of Hoff et al. (col. 7, line 17) with the full acquisition and later gating of Roth for the reasons discussed above regarding Ramamurthy et al.

Claim 5 claims recognizing a jet in color Doppler as an event. Ramamurthy et al. use color Doppler imaging, but do not disclose a processor to recognize a jet. The highest velocity mapping alone does not identify a jet event, but only results in an image of the highest velocities where the highest velocities may or may not be associated with a jet.

Claim 39 claims an event based on a rate of change of velocities. Ramamurthy et al. identify a highest velocity, but not a rate of change.

Claims 13 claims a cropping factor based upon characterization of an image. Holupka et al. crop automatically or manually with a special mask (col. 6, lines 19-28). Holupka et al. do not disclose a cropping factor or a cropping factor based on characterization of an image.

Regarding claims 14-15 and 17-19, a person of ordinary skill in the art would not have used the feedback of Greer et al. in the system of Roth. Roth identifies images after an exam and so does not need the feedback. Roth also generally identifies one image every heart cycle or few heart cycles. The feedback of Greer et al. would be provided at the same frequency. Such

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frequent feedback, such as beeps or visual flashes, would be distracting and undesired in a medical environment absent an emergency.

Claim 31 claims selecting a subset of image data sets with decimation. Hossack et al. decimates within a given image (col. 7 lines 56-58), not decimation of image data sets.
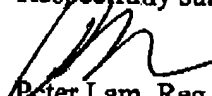
CONCLUSION

Applicants respectfully submit that all of the pending claims are in condition for allowance and seeks early allowance thereof. If for any reason, the Examiner is unable to allow the application but believes that an interview would be helpful to resolve any issues, he is respectfully requested to call the undersigned at (650) 943-7350 or Craig Summerfield at (312) 321-4726.

PLEASE MAIL CORRESPONDENCE TO: Respectfully submitted,

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